

**Environmental Science 3205**

Name: \_\_\_\_\_

**Chapter 4: Protecting Species**

**Distinguish between Natural Extinctions and Anthropogenic Extinctions**

Extinctions have been \_\_\_\_\_ and that these extinctions represent a \_\_\_\_\_ process.

For example, the extinction of dinosaurs occurred millions of years before humans were on the planet

\_\_\_\_\_ extinctions (\_\_\_\_\_) are brought on by habitat loss, over-hunting, over-fishing, pollution, etc.

\_\_\_\_\_ extinctions result from \_\_\_\_\_ (such as volcanic eruptions, tidal waves, earthquakes), \_\_\_\_\_, and changing \_\_\_\_\_ (competition, predation, disease, etc.)

Recent human activities have been directly linked to species extinctions.

Species extinctions, in general, are now occurring at a \_\_\_\_\_ than any other time in history (catastrophic events aside).

Understanding of why species go extinct is very important.

- Scientists, recognize that \_\_\_\_\_ from ecological interactions like food chains and food webs and our interactions in the environment are in fact "natural".
- As a result, some scientists argue that there is little or no distinction between natural extinctions and anthropogenic extinctions.

**Why are species at risk?**

The major reason is \_\_\_\_\_, resulting from unsustainable development, such as:

- urban and agricultural development (sprawl)
- **Read about Leather back Turtle**

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#### **Leatherback turtle**

- Largest range of any reptile
- Seen in NL waters in the summers
- Species in decline due to habitat degradation of marine environment (entangled in fishing gear, swallowing garbage which can block gastro intestinal system)
- and destruction of nesting sites (mechanical raking of beaches and off road vehicles)
- Protection of nesting beaches in Central America should increase hatchling mortality

#### **Why are species at risk?**

The primary human associated factors contributing to extinction are:

1. Habitat loss and degradation
2. Introduced species
3. Overexploitation
4. Pollution

#### **Examples of Factors Contributing to Extinction**

- \_\_\_\_\_ (poisons leaching in landfills or sewage emptying in water ways)
- \_\_\_\_\_ (mining, forestry eg clear-cut logging)
- \_\_\_\_\_ for hydro-electric projects drowns river, forest and marshland ecosystems
- \_\_\_\_\_ bottom dragging, lobster and crab gear entangling whales
- Silting: \_\_\_\_\_ into rivers clogs them with mud, changing the fish habitat
- Silt can also clog the gills of fish

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#### **Pollution**

A pollutant is \_\_\_\_\_ that, when introduced in the environment \_\_\_\_\_ a resource or the health of humans or any organism

Eg: sewage, garbage, chemicals, pesticides etc.

#### **Bioaccumulation**

- The \_\_\_\_\_ in an organisms body
- As pollutants are passed from \_\_\_\_\_ the resulting increase in concentration is known as \_\_\_\_\_

When garbage is not properly disposed of or recycled it can impact various species. Some animals will swallow plastics for example which will cause illness or death.

#### **Climate change and species at risk**

- Evidence is growing that \_\_\_\_\_ are directly changing the \_\_\_\_\_
- Globally temperatures are rising
- Consequences will be drought floods and rapidly changing ecosystems
- Temperatures in the arctic \_\_\_\_\_ at \_\_\_\_\_ of the rest of the world
- The polar bear lives all over the arctic usually on ice so it can hunt its favorite prey: the seal
- They usually live off stored fat in the summers when it is difficult to hunt seal
- Global warming will lengthen arctic summers and cause the Polar Bear hardship and make it unlikely they will reproduce effectively

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**Species at risk**

- \_\_\_\_\_
- \_\_\_\_\_ (eg. Colt's foot, replacing Balsam fir, European Green Crab,)

What are the effects of accidental or unplanned introductions.

For example, coyotes and rats.

Sometimes introduced species out compete indigenous species and may result in their extinction or extirpation.

A species can be \_\_\_\_\_ brought into an ecosystem that is outside its normal distribution. Such a species is called an \_\_\_\_\_

When an alien species spreads aggressively and out-competes local native (indigenous) species, it is called an \_\_\_\_\_.

*Over \_\_\_\_\_ of plant species in Newfoundland and Labrador are \_\_\_\_\_. Of these plants, a few have taken over natural habitats, reducing biodiversity by changing species composition.*

|  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Deer Mouse</li> <li>• Eastern Chipmunk</li> <li>• Green Frog</li> <li>• House Mouse</li> <li>• House Sparrow</li> <li>• Lake Whitefish</li> <li>• Masked Shrew</li> <li>• Mink</li> <li>• Mink Frog</li> <li>• Moose</li> <li>• Red Squirrel</li> </ul> | <ul style="list-style-type: none"> <li>• Muskoxy</li> <li>• Norway Rat</li> <li>• Northern Bank Vole</li> <li>• Rock Dove</li> <li>• Ruffed Grouse</li> <li>• Southern Red-Backed Vole</li> <li>• Spruce Grouse</li> <li>• Wood Frog</li> <li>• American Toad</li> <li>• Snowshoe Hare</li> </ul> |
|--|---|

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Birch Leaf-Mining Sawfly</li> <li>• Cabbage White Butterfly</li> </ul> | <ul style="list-style-type: none"> <li>• Black Knapweed</li> <li>• Canada Thistle</li> </ul> |
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|   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Centipedes</li><li>• European Earwig</li><li>• European Skipper</li><li>• Fir Coneworm</li><li>• Long Horned Beetles</li><li>• Multicolored Asian Lady Beetle</li><li>• Water Scavenger</li></ul> | <ul style="list-style-type: none"><li>• Goutweed</li><li>• Purple Loosestrife</li><li>• Japanese Knotweed</li><li>• St. John's Wort</li><li>• Wild Chervil</li><li>• Colts Foot</li><li>• Yellow Iris</li><li>• Sea Buckthorn</li></ul> |
|---|---|

These invasive species \_\_\_\_\_ the environment, the economy and even human life.

They do this by threatening local wildlife populations, reducing populations of economically important species, and by carrying diseases harmful to humans. (eg West Nile Virus)

**The process of classifying an organism as a species at risk.**

- (i) species assessment
- (ii) COSEWIC's recommendation
- (iii) government action/ inaction

**COSEWIC listings that categorize species at risk.**

- (i) not at risk
- (ii) data deficient
- (iii) special concern
- (iv) threatened
- (v) endangered
- (vi) extirpated
- (vii) extinct

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COSEWIC

Not at risk: A wildlife species that has been evaluated and found to be not at risk of extinction.

Data deficient: A wildlife species for which there is inadequate information to make a proper assessment of its risk of extinction. A temporary designation that is used until more data is collected and assessed.

Special concern: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats. Refers to species that are considered vulnerable in provincial legislation.

Threatened: A wildlife species likely to become endangered if limiting factors are not reversed.

Endangered: A wildlife species facing imminent extirpation or extinction.

Extirpation: A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.

Extinct: A wildlife species that no longer exists.

Recovery process of a species at risk.

- (i) research
- (ii) monitoring
- (iii) stewardship
- (iv) education
- (vi) socio-economic
- (vii) recovery teams

Note that when species are designated as " \_\_\_\_\_ " a separate \_\_\_\_\_ is developed for each species (One Step).

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When species are designated as " \_\_\_\_\_ ", recovery becomes a \_\_\_\_\_ process:

- First, a \_\_\_\_\_ is written for each species. This document identifies the steps required to recover the species whereby it is no longer considered At Risk.
- Second, \_\_\_\_\_ are developed which identifies the specific actions that are required to carry out the steps identified in the recovery strategy.

Assessment process includes:

1. \_\_\_\_\_ that require assessment
2. \_\_\_\_\_ , knowledge and information into the COSEWIC Status Report
3. \_\_\_\_\_ of the species' risk.

Who is COSEWIC

- Committee on the Status of Endangered Wildlife in Canada.
- They are the group that assesses the "At Risk" status of native wildlife species in Canada.
- They are a non-government body that started in 1977. Members are university academics, independent specialists, Aboriginal people, and/or government, museum or independent biologists.
- They \_\_\_\_\_ . They then compile data, knowledge, and information into the COSEWIC Status Report, which is viewed largely as a recommendation

Government action results in listing the species under the SARA (Species at Risk Act) legislation. The course of action that follows depends on the nature of the listing.